

27 Investigating Boomtown's Weather



The shapes of landforms are affected by flowing water. Water comes from several sources, including rain, river flow from mountains, and ocean waves hitting the beach.

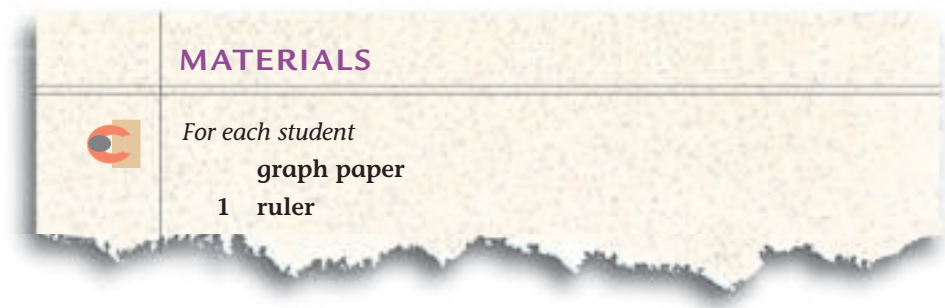
One hundred years ago, the Boomtown historian wrote about the Rolling River flooding from heavy rain. The area had 30 centimeters (12 inches) of rain in one month, most of which fell during one week. Main Street was covered with water! The base of Green Hill was flooded, Delta Marsh was full of water, and Seaside Cliff had streams running off its edge.

Flooding from such storms could create problems for housing built at these locations. Looking at the history of Boomtown's average rainfall will help you determine the risk of future flooding.

CHALLENGE

Is Boomtown's rainfall likely to cause flooding?





PROCEDURE

1. Use the data in Table 1 below to make the following calculations.
 - a. Calculate the mean annual rainfall for this 10-year period.
Hint: Calculate the **mean** by adding up all of the values and dividing by the total number of values.
 - b. Calculate the mode for annual rainfall for this 10-year period.
Hint: The **mode** is the value that appears most often.
 - c. Calculate the median annual rainfall for this 10-year period.
Hint: The **median** is the middle value after the data has been listed from smallest to largest OR largest to smallest. If the data has an even number of values, then the median is the average (the mean) of the two middle values.
2. Use the data in Table 1 to make a bar graph of Boomtown's annual rainfall in centimeters.
3. Draw a horizontal line across your graph to show the mean annual rainfall. Label the line, "Mean: annual."

Table 1: Annual Rainfall in Boomtown: 1996–2005

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Rainfall (centimeters)	92	99	89	94	94	84	97	85	94	72
Rainfall (inches)	36	39	35	37	37	33	38	33	37	28

Data provided by Boomtown Weather Service

Table 2: Average Monthly Rainfall in Boomtown: 1996–2005

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Rainfall (centimeters)	7	10	7	3	3	0	0	3	7	7	25	20
Rainfall (inches)	3	4	3	1	1	0	0	1	3	3	10	8

Data provided by Boomtown Weather Service

4. Use the data in Table 2 above to make the following calculations.
 - a. Calculate the mean monthly rainfall.
 - b. Calculate the mode monthly rainfall.
 - c. Calculate the median monthly rainfall.
5. Use the data in Table 2 to make a bar graph of Boomtown's average monthly rainfall in centimeters.
6. Draw a horizontal line across your graph to show the mean monthly rainfall. Label the line, "Mean: monthly."

ANALYSIS



1. Look at the graphs of annual and monthly rainfall in Boomtown. Describe any patterns that you see in the rainfall.
2.
 - a. Is there anything unusual about Boomtown's annual rainfall? Explain.
 - b. Is there anything unusual about Boomtown's monthly rainfall? Explain.
3. During the same year, a town in California and a city in Maryland both received about 99 cm (39 inches) of rain. In August, the town in California had less than one centimeter of rain while the city in Maryland had 7 cm (3 inches). Explain how these two places could have the same annual rainfall.



4. Which location—Delta Marsh, Green Hill, or Seaside Cliff—would be most affected by
 - a. a year of typical rainfall in Boomtown? Explain.
 - b. another flood in Boomtown? Explain.
5. **Reflection:** How does Boomtown's rainfall pattern compare to that of your community?

EXTENSION

Use the data in Table 3 below to make a bar graph of Boomtown's monthly rainfall in 1995, in centimeters. Compare it to the graphs you made in this activity.

- a. How was the annual rainfall in 1995 both similar to and different from Boomtown's annual rainfall from 1996 through 2005?
- b. How was the monthly rainfall pattern in 1995 both similar to and different from Boomtown's average monthly rainfall from 1996 through 2005?

Table 3: Monthly Rainfall in Boomtown in 1995

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Rainfall (centimeters)	0	6	7	7	7	0	0	7	7	5	15	11
Rainfall (inches)	0	2	3	3	3	0	0	3	3	2	6	4

Data provided by Boomtown Weather Service